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ABSTRACT

Although in-migration and out-migration levels of communities or counties are usually positively correlated, little work has been done on the correlation between in-migration and out-migration within population subcategories. Using a special 1980 data source from the U.S. Census Bureau, this paper examines migration patterns in 30 age/education categories of the adult population in the 653 counties of Arkansas, Illinois, Louisiana, Kentucky, Mississippi, Missouri, and Tennessee. The categories crossed five age groups with six educational levels. The correlation between in-migration and out-migration was not very strong in itself, but was strongly affected by the relative educational levels of in-migrants and out-migrants, and only very weakly affected by their relative ages. When educational levels were the same, correlations were positive and reached as high as .60. When educational levels of in-migrants and out-migrants differed, in either direction, correlations became negative. Counties that were destinations for highly educated persons also lost many such persons, and also lost significantly fewer of their people with low levels of education. For counties with colleges or universities, the highest average correlation at the same levels of education was .38 when in-migrants were one age category younger than out-migrants. Counties characterized by simultaneous in-migration and out-migration of persons with low educational attainment were mostly rural Kentucky counties in or near Boone National Forest. Contains six statistical tables and four figures. (SV)

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ED 384 447

Correlation Between Age and Education Specific In and Out Migration Rates

by

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and
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SP2093 December 1993

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Correlation between Age and Education specific In and Out migration rates

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Abstract

Recent work on migration has tended to emphasize the weaknesses of net migration, and to advocate analyzing in-migration and out-migration separately. However, data sources available for this are very limited, and, when geographical units of analysis, such as communities or counties, are used, in-migration and out-migration are usually positively correlated. Since the relationship between in-migration and out-migration results from the complicated, concrete processes of human capital formation and utilization, specific patterns should emerge. However, partly because of data limitations, relatively little has been done on the correlation between in-migration and out-migration within sub-categories of the population. Using a special data source from the U. S. Census bureau, and examining the 653 counties found in the seven states making up the Lower Mississippi Delta region, we examine these correlations in detail, focusing upon 30 age and educational level categories of the population. Although in-migration and out-migration are correlated, with an overall average of about +.11, it is the patterns which are the most interesting. Differences in educational levels of in-migrants and out-migrants substantially affect the correlations. When educational levels are the same, correlations are positive and reach as high as .60. When educational levels are different, in either direction, these correlations become negative. To examine this pattern further, we isolate communities with colleges and universities, presumably experiencing both in-migration and out-migration of people with higher levels of education. We also try to isolate those counties with high levels of in-migration and out-migration of people with the lowest levels of education, and find most of them to be rural counties in Kentucky, along a line defined by the Boone National Forest in Eastern Kentucky.

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[1] Voth is Professor of Rural Sociology, University of Arkansas. Ramey is a work-study student in the Department of Agricultural Economics and Rural Sociology at the University of Arkansas. Work on this paper is supported, in part, by Arkansas Agricultural Experiment Station research project 1449, and by the Arkansas Center of the Rural Policy Research Institute (RUPRI).

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Correlation between Age and Education specific In and Out migration rates

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A very large proportion of the work on internal migration uses net migration, usually calculated as a residual. At the same time, a substantial literature critical of the use of net migration rates (see Galle, et al., 1993) has developed. This literature usually advocates the use of in-migration and out-migration rates separately. Also both the prevailing "Push and pull" perspective and the "human capital" approach to migration imply the need to examine in-migration and out-migration separately, since one implies that different community characteristics attract different people, and, perhaps, repel others and the other implies that, throughout the life cycle, preferred destinations and origins will vary substantially (Voth, Killian, and Farmer, forthcoming). It is well known, though, that, when geographical entities are the units of analysis, in-migration and out-migration tend to be positively correlated, sometimes quite highly. This generalization is quite consistent with what is known about migration streams and counter-streams. Galle, et al. have recently attempted to "resurrect" net migration, as well as several other measures, such as the "turnover rate,", etc. in a brief article which examines the relationships among the various measures of migration (1993). They focus, in part, upon the mathematical relationships between the measures of association of in-migration, out-migration, and net (or other combined) measures of migration with various "determinants" of migration.

One important aspect of these interrelationships among measures of migration is the nature of the (usually) positive empirical relationship between in-migration and out-migration. In the form of the county-to-county migration flow tapes for 1980 and similar data soon to be available for 1990, data are now available which allow detailed empirical analysis of these relationships. Here we demonstrate some of these relationships for the 653 counties of the seven states included in what is referred to as the Lower Mississippi Delta Region (Arkansas, Illinois, Louisiana, Kentucky, Mississippi, Missouri, Tennessee), focusing upon a detailed classification of migrants by age and educational level. These counties range in size from Cook county in Illinois to the many very small rural counties found in these seven states. 100 of the counties are metropolitan, the rest are non-metropolitan.

Migration rates were calculated for each of the 30 age and educational level groups for each of the 653 counties. The age and educational level categories are shown in Table 1. Because of the existence of some empty denominators in small counties, the denominators used to calculate the 30 rates for each county were, throughout, all persons in the respective age category. Thus, all educational level groups among those 18-24 years of age had the same denominator. A 30 by 30 correlation matrix was calculated among these rates. This correlation matrix is presented in Table 2. To facilitate interpretation, Table 2 includes the ranks of these correlation coefficients within columns, that is within each of the 30 out-migration rates. The ranks are from lowest correlation to highest.

The patterns that emerge include the following: First, the main diagonal is always positive, and sometimes relatively large. The .60 for the out-migration and in-migration of 18-24 year-olds who have

completed college (OUTRAT5 and INRAT5) is the highest on the main diagonal, followed by the .56 for the out-migration and in-migration of those 35-44 with advanced college degrees (OUTRAT18 and INRAT18). Interestingly, the lowest correlation on the main diagonal is for the in-migration and out-migration of those with some college, but who have not completed college (OUTRAT4 and INRAT4), the immediate neighbor of OUTRAT5 and INRAT5 above, which is the highest on the main diagonal. Second, the overall average of all 900 correlations is positive, but low (.11). Third, each column has negative correlations, the greatest of which are in the range of -.20 to -.28. The greatest negative is between the out-migration of 25-34 year-olds with 1-3 years of college (OUTRAT10) and the in-migration of 25-34 year-olds with the lowest level of eduction (INRAT7). Finally, the main diagonal, while it ranks quite high, is not the highest correlation in most columns. See, for example, the columns for OUTRAT5 and OUTRAT6.

Table 3 was calculated as averages of sub-groups of these 900 correlation coefficients to explore the patterns of correlation between in-migration and out-migration more closely focusing, of course, upon the age/education matrix. The horizontal axis of Table 3 represents the relationship between in-migration rates and out-migration rates by educational level, ranging from those where the educational level of in-migrants and out-migrants was the same (0), to those with in-migrants from five categories[2] less education than out-migrants (-5), to those with in-migrants with five categories more education than out-migrants (+5). The vertical axis similarly represents age level differences among in-migrants and out-migrants. The mid-point again represents average correlations between categories in which in-migrants and out-migrants were of the same age. Since there were only five categories of age, the maximum differences are, of course, four categories in the negative direction (in-migrants younger than out-migrants) and in the positive direction (in-migrants older than out-migrants).

Selected components of Table 3 are displayed in Figures 1 to 3. Figure 1 shows the average correlations between in-migration and out-migration at the negative extreme (in-migrants five categories less education, at the mid-point (in-migrants and out-migrants at the same level of education), and at the positive extreme (in-migrants five categories older). Figures 2 and 3 show the relationship between age differences and the average correlation between in-migration and out-migration, illustrating, as it were, the third dimension of Figure 1. Figure 2 shows the relationship between age differences at all negative education differences up to zero, Figure 3 shows the relationship between age differences at all positive education differences from zero to five.

The pattern on the education dimension is very distinct. It is symmetrical, is highest when educational levels of in-migrants and out-migrants are the same, declines as these levels diverge in both directions, and ultimately becomes negative when the educational difference among in-migrants and out-migrants exceeds three categories.

The highest average correlation coefficient is not, however, at the center of the matrix, where both age and education levels are the same (the main diagonal of Table 2). The correlation at the center is .30, whereas the highest average correlation is for those cases where

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[2] We arbitrarily used the categories of educational level and age from Table 1, rather than trying to convert these to years of education and years of age. It should be noted, of course, that the categories are not of the same length.

in-migrants are one age category less than out-migrants, while education is the same (.33, Table 3).

The age dimension has a lesser impact upon the correlation between in-migration and out-migration, and the pattern is quite biased. The highest average correlation is found where in-migrants are two age categories younger than out-migrants (.14).

A two-way analysis of variance was performed with the correlation between the in-migration and out-migration rates as the dependent variable and the education and age categories as the factors. It is presented in Table 4. The first frame of Table 4 shows it for all 653 counties taken together (All counties). Education differences explained about 44% of the variance in the correlation coefficients and age differences only about 2% (Table 4).

Thus, it appears that (1) educational levels are more important in the correlation between in-migration and out-migration, (2) at the same levels of education, in-migration and out-migration are positively correlated, whereas at substantially different levels, in-migration and out-migration are negatively correlated, (3) by age, in-migration of somewhat younger people tends to be associated with the out-migration of somewhat older people, and (4) hardly any of these correlations are high enough to allow predicting or estimating one from the other (in-migration from out-migration or vice-versa).

These patterns of correlation between out-migration and in-migration by educational level might well summarize several significant underlying dynamics. One which is almost certainly operative is higher education. A key aspect of the communities of both origin and destination, especially when migration is seen as part of a human capital development and exploitation process, is the existence of higher education institutions. Thus it seems likely that, to a significant extent, the pattern of correlations associated with differences in educational level might result from this human capital development process. Counties with colleges or universities presumably both receive and lost more relatively highly educated persons.

At the other end of the continuum, some counties may be characterized by the "circulation" of people with low levels of education. Presumably these might be, for example, rural counties with on-going streams of out and return migration to specific urban areas for employment, streams such as those out of Kentucky (Brown, etc.).

First we examined the possible effect of the presence of colleges or universities. Figure 4 shows the pattern of average correlations for two groups of counties by educational differences for those that had colleges or universities and those that did not. It is clear from Figure 4 that the pattern of in-migration and out-migration being correlated along similar educational levels is more pronounced when colleges or universities are present. However, it also exists for counties without these institutions, indicating there is more involved than merely migrating for post-highschool education and training. The analyses of variance of these counties are also shown in Table 4. Educational level differences for counties without colleges and universities still account for 32 percent of the variation in the correlation between in-migration and out-migration.

We then examined those counties which showed the highest values on migration factors representing the in-migration of people with low levels of education and the in-migration of people with the same characteristic. These factors were created from the 30 in-migration and

out-migration rates (Voth, et al., 1993). Table 5 shows the 12 counties showing simultaneously the highest rates of out-migration and in-migration of people with the lowest levels of education (the criterion was an arbitrary +1.5 or more on both factors). Remarkably, 9 of these counties are in Kentucky, all are rural, and only 2 are in the Lower Mississippi Delta region, where one might have expected this pattern of migration. Most part they are very small rural counties. Perhaps the most interesting aspect of the 9 found in Kentucky is that 6 (Lewis, Menifee, Powell, Wolfe, Jackson, and Whitley) either contain parts of, are in close proximity to the Daniel Boone National forest. Four (Menifee, Powell, Wolfe, and Jackson) are in the area covered in the early studies of migration patterns, kinship ties affecting migration, and assimilation carried out by Schwarzweller (1963), Brown, et al (1963). Similar rural-urban migration patterns are also discussed in Fuller (1970), who summarizes the very interesting work on migration streams done by Eldon Smith in his Ph. D. Dissertation (1956).[1]

To examine the stability of the correlations between in-migration and out-migration for the 30 age/educational level groups in Table 2 a correlation matrix was calculated among the seven Lower Mississippi delta states, the overall of all states combined, and those counties with and without colleges or universities. This correlation matrix is shown in Table 6. All correlations are, of course, statistically significant at the .001 level. Most are high, in the range of .65 and above. Arkansas stands out with a relatively low correlation with the total of all states combined, and, of course, also with the other states. Other than Arkansas, however, Table 6 indicates a high degree of stability among the correlations between in-migration and out-migration of the 30 age/educational level categories, at least for the states of the Lower Mississippi Delta region, suggesting a certain amount of generalizability for the empirical relationships shown here.

In summary, the correlation between in-migration and out-migration which is not, by itself, very strong, is strongly affected by the relative educational levels of the in-migrants and out-migrants, and only very weakly affected by their relative ages. Counties that are destinations for highly educated persons also lose many such persons. These counties, in turn, lose significantly fewer of their people with low levels of education. For counties with colleges or universities, the highest average correlation at the same levels of education is .38 when in-migrants are one category younger than out-migrants. Although this pattern is partly the consequence of the human capital formation function of communities which have colleges or universities, it prevails elsewhere as well. For some reason Kentucky has nearly all of the counties characterized by the lower end of this correlation, the simultaneous in-migration and out-migration of persons with very low levels of education. In Kentucky these counties tend to either contain or be close to a major national forest.

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[1] It seems evident, then, that the role of dependance upon forestry, national forests, timber production, recreation, or some combination of these, or, perhaps, even long-standing social organizational and cultural patterns associated with counties where any or all of these things prevail, should be examined as a possible "cause" of the "circulation" of persons with very low levels of education. That can, of course, be done with this data set. Perhaps additional work will be completed by the time the paper is presented.

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Table 1
Age/Educational Level Groups
for which Migration Rates are Calculated

Education/Age->	18-24	25-34	35-44	45-64	65+
Elementary	Group 1	Group 7	Group 13	Group 19	Group 25
1-3 H./School	Group 2	Group 8	Group 14	Group 20	Group 26
4 High School	Group 3	Group 9	Group 15	Group 21	Group 27
1-3 College	Group 4	Group 10	Group 16	Group 22	Group 28
4 College	Group 5	Group 11	Group 17	Group 23	Group 29
5+ College	Group 6	Group 12	Group 18	Group 24	Group 30

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Table 2
Correlation Matrix of All In-migration Rates with All Out-Migration Rates

	OUTRAT1	Rank1	OUTRAT2	Rank2	OUTRAT3	Rank3	OUTRAT4	Rank4	OUTRAT5	Rank5	OUTRAT6	Rank6
INRAT01	0.1924	27	0.1290	17	-0.0217	5	-0.1078	4	-0.1936	5	-0.0854	7
INRAT02	0.1305	26	0.2528	23	0.2568	24	0.0863	12	-0.1042	7	-0.0399	10
INRAT03	-0.0475	13	0.0522	14	0.1763	17	0.1357	17	0.4373	27	0.3667	26
INRAT04	-0.1477	5	-0.1638	2	-0.1694	1	0.0836	11	0.7613	30	0.6550	30
INRAT05	-0.1971	1	-0.2029	1	-0.0803	3	0.1589	21	0.6015	29	0.5529	29
INRAT06	-0.1234	7	-0.1498	3	-0.1115	2	0.1076	13	0.4812	28	0.4705	28
INRAT07	0.2017	28	0.2073	20	-0.0275	4	-0.2614	2	-0.2231	4	-0.1842	2
INRAT08	0.1038	25	0.3204	29	0.2746	25	-0.0741	5	-0.2528	2	-0.2175	1
INRAT09	-0.0404	14	0.3085	28	0.4431	30	0.1223	16	-0.0819	8	-0.1022	5
INRAT10	-0.1622	4	0.0144	10	0.1953	21	0.2565	29	0.1911	22	0.1112	19
INRAT11	-0.1922	2	-0.0846	5	0.1149	12	0.2806	30	0.2088	23	0.1278	23
INRAT12	-0.1753	3	-0.0985	4	0.0144	7	0.2163	27	0.4133	25	0.3621	25
INRAT13	0.2757	30	0.2971	26	0.0513	8	-0.2669	1	-0.2629	1	-0.1339	3
INRAT14	0.0376	22	0.3071	27	0.2392	23	-0.0413	6	-0.1527	6	-0.0656	8
INRAT15	-0.0290	17	0.2888	24	0.3622	29	0.0822	10	-0.0357	11	-0.0394	11
INRAT16	-0.0829	10	0.1094	16	0.2019	22	0.1706	24	0.0826	16	0.0575	17
INRAT17	-0.1045	8	0.0048	9	0.0561	9	0.1901	25	0.1941	21	0.1200	21
INRAT18	-0.1327	6	-0.0723	6	0.0087	6	0.2111	26	0.4160	26	0.3718	27
INRAT19	0.2493	29	0.3457	30	0.1756	16	-0.2405	3	-0.2371	3	-0.1269	4
INRAT20	0.0689	23	0.2920	25	0.3300	28	0.0046	7	-0.0785	9	-0.0542	9
INRAT21	-0.0109	18	0.2382	22	0.3162	27	0.1654	23	-0.0069	12	0.0034	13
INRAT22	-0.0387	16	0.1456	19	0.1799	18	0.1608	22	0.0487	14	0.0336	16
INRAT23	-0.0099	19	0.0462	12	0.0730	10	0.1494	20	0.1238	18	0.1223	22
INRAT24	-0.0982	9	-0.0412	8	0.0942	11	0.1150	14	0.2478	24	0.2236	24
INRAT25	0.0991	24	0.2188	21	0.1826	19	0.0047	8	-0.0441	10	-0.0904	6
INRAT26	0.0120	21	0.1408	18	0.1901	20	0.1486	18	0.0012	13	-0.0159	12
INRAT27	-0.0615	12	0.0946	15	0.2945	26	0.2239	28	0.0690	15	0.0252	15
INRAT28	-0.0735	11	0.0502	13	0.1577	15	0.1211	15	0.1245	19	0.0626	18
INRAT29	-0.0399	15	0.0386	11	0.1363	14	0.0759	9	0.1510	20	0.1146	20
INRAT30	0.0025	20	-0.0493	7	0.1270	13	0.1492	19	0.1087	17	0.0078	14
Average	-0.0131		0.1913		0.1414		0.0809		0.0986		0.0878	

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Table 2 (Cont.)
Correlation Matrix of All In-migration Rates with All Out-Migration Rates

	OUTRAT7	Rank7	OUTRAT8	Rank8	OUTRAT9	Rank9	OUTRAT10	Rank10	OUTRAT11	Rank11	OUTRAT12	Rank12
INRAT01	0.1860	27	0.0635	18	-0.0105	5	-0.0626	5	-0.1789	5	-0.1255	5
INRAT02	0.0633	25	0.1197	23	0.3589	28	0.2107	14	-0.0402	7	-0.0464	10
INRAT03	-0.1734	8	-0.0584	11	0.3297	27	0.5095	30	0.5299	27	0.4995	25
INRAT04	-0.2090	3	-0.2175	2	-0.0895	1	0.3828	24	0.8205	30	0.8252	30
INRAT05	-0.2616	2	-0.2251	1	0.0028	6	0.4016	26	0.6751	29	0.7439	29
INRAT06	-0.1928	5	-0.1684	3	-0.0266	4	0.3002	20	0.5557	26	0.7192	28
INRAT07	0.2638	29	0.1705	26	-0.0326	3	-0.2873	1	-0.2539	1	-0.2444	2
INRAT08	0.1185	26	0.2003	28	0.1892	18	-0.0801	4	-0.2377	3	-0.2459	1
INRAT09	-0.1052	13	0.1063	22	0.5081	30	0.2180	15	-0.0113	10	-0.1092	7
INRAT10	-0.1992	4	-0.0978	7	0.2981	26	0.4582	29	0.2823	22	0.2234	22
INRAT11	-0.2622	1	-0.1159	6	0.2225	21	0.4314	28	0.2993	23	0.2468	23
INRAT12	-0.1890	6	-0.1647	4	0.1156	12	0.4189	27	0.4997	26	0.5446	27
INRAT13	0.3049	30	0.1216	24	-0.0466	2	-0.2194	2	-0.2538	2	-0.2391	3
INRAT14	0.0619	24	0.2114	29	0.1592	16	-0.0483	6	-0.1132	6	-0.1222	6
INRAT15	-0.0618	17	0.1000	21	0.3592	29	0.2088	13	0.0262	11	-0.0117	11
INRAT16	-0.1561	10	-0.0217	14	0.2909	25	0.3051	21	0.1689	18	0.1215	16
INRAT17	-0.1307	11	-0.0699	10	0.1322	14	0.3131	22	0.2415	21	0.2176	21
INRAT18	-0.1859	7	-0.1201	5	0.1159	13	0.3959	25	0.4978	25	0.5289	26
INRAT19	0.2507	28	0.2593	30	0.0407	7	-0.2120	3	-0.2191	4	-0.2067	4
INRAT20	0.0377	22	0.1845	27	0.2415	22	0.0484	9	-0.0232	9	-0.0755	8
INRAT21	-0.0657	15	0.0874	20	0.2715	24	0.1855	10	0.0714	12	0.0066	12
INRAT22	-0.0620	16	0.0335	17	0.2031	20	0.2751	19	0.1247	14	0.1056	15
INRAT23	-0.0552	18	-0.0465	12	0.0724	9	0.2333	17	0.1755	19	0.1551	19
INRAT24	-0.1636	9	-0.0760	8	0.1073	11	0.2662	18	0.3510	24	0.3133	24
INRAT25	0.0381	23	0.1544	25	0.1689	17	0.0163	7	-0.0258	8	-0.0574	9
INRAT26	-0.0523	19	0.0651	19	0.2004	19	0.2032	11	0.0752	13	0.0089	13
INRAT27	-0.1127	12	0.0011	15	0.2482	23	0.3194	23	0.1277	15	0.0711	14
INRAT28	-0.0772	14	0.0066	16	0.1324	15	0.2236	16	0.1664	17	0.1316	18
INRAT29	-0.0137	20	-0.0302	13	0.0978	10	0.2055	12	0.1757	20	0.1678	20
INRAT30	-0.0060	21	-0.0717	9	0.0528	8	0.1432	9	0.1281	16	0.1267	17
Average	-0.0470		0.0134		0.1571		0.1921		0.1545		0.1424	

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Table 2 (Cont.)

Correlation Matrix of All In-migration Rates with All Out-Migration Rates

	OUTRAT13	Rank13	OUTRAT14	Rank14	OUTRAT15	Rank15	OUTRAT16	Rank16	OUTRAT17	Rank17	OUTRAT18	Rank18
INRAT01	0.1673	27	0.0827	18	-0.0198	4	-0.0108	6	-0.0782	6	-0.1267	5
INRAT02	0.1043	25	0.0948	19	0.3341	26	0.1966	12	0.0402	9	-0.0047	9
INRAT03	-0.1349	11	0.0104	12	0.4139	30	0.4071	27	0.2574	22	0.4478	25
INRAT04	-0.1480	6	-0.1308	2	0.0777	5	0.2620	20	0.3330	25	0.6539	30
INRAT05	-0.2165	1	-0.1483	1	0.1208	10	0.3511	24	0.4182	30	0.6500	29
INRAT06	-0.1483	7	-0.0934	5	0.0855	6	0.2495	18	0.3712	28	0.6253	28
INRAT07	0.2467	28	0.0442	16	-0.1421	1	-0.1900	2	-0.2256	1	-0.2199	3
INRAT08	0.1098	26	0.1677	30	0.1303	12	-0.0702	4	-0.1474	4	-0.1997	4
INRAT09	-0.0484	19	0.0956	20	0.4064	29	0.2117	16	0.0579	12	-0.0043	10
INRAT10	-0.1839	4	-0.0500	8	0.3779	28	0.4182	29	0.2691	24	0.3159	22
INRAT11	-0.2609	1	-0.0966	6	0.2988	22	0.4300	30	0.3440	26	0.3421	23
INRAT12	-0.2246	2	-0.1125	4	0.2348	19	0.4109	28	0.3815	29	0.5839	27
INRAT13	0.2524	29	0.0678	17	-0.1266	2	-0.1898	3	-0.1930	3	-0.2240	2
INRAT14	0.0742	22	0.1101	24	0.1109	9	-0.0650	5	-0.1096	5	-0.0948	6
INRAT15	-0.0488	18	0.1191	26	0.3566	27	0.2059	14	0.0481	10	0.0660	13
INRAT16	-0.1477	9	-0.0018	11	0.3028	23	0.3780	25	0.1619	19	0.2265	20
INRAT17	-0.1483	8	-0.0592	7	0.2154	18	0.3495	23	0.2473	23	0.3010	21
INRAT18	-0.1564	5	-0.1129	3	0.1957	16	0.3851	26	0.3482	27	0.5619	26
INRAT19	0.2952	30	0.1318	27	-0.0703	3	-0.2090	1	-0.1983	2	-0.2248	1
INRAT20	0.0175	22	0.1456	29	0.1911	15	-0.0076	7	-0.0694	7	-0.0396	8
INRAT21	-0.0321	21	0.1078	23	0.3046	24	0.1320	9	0.0499	11	0.0563	12
INRAT22	-0.1119	12	0.0379	15	0.2451	21	0.2816	21	0.1523	18	0.1593	15
INRAT23	-0.0465	20	0.0215	14	0.1301	11	0.3015	22	0.2094	21	0.2191	18
INRAT24	-0.1435	10	-0.0179	10	0.1584	14	0.2582	19	0.1928	20	0.3614	24
INRAT25	0.0774	24	0.1014	22	-0.0971	7	0.0248	8	-0.0563	8	-0.0482	7
INRAT26	-0.0700	16	0.1329	28	0.2444	20	0.1866	13	0.0661	13	0.0353	11
INRAT27	-0.0780	15	0.1150	25	0.3225	25	0.2414	17	0.0820	14	0.1044	14
INRAT28	-0.1055	13	0.0199	13	0.2066	17	0.2062	15	0.1113	17	0.2037	17
INRAT29	-0.0697	17	0.0382	21	0.1532	13	0.1555	11	0.0856	15	0.2208	19
INRAT30	-0.0944	14	-0.0273	9	0.1186	9	0.1381	10	0.0892	16	0.1885	16
Average	-0.0425		0.0287		0.1825		0.1810		0.1093		0.1712	

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Table 2 (Cont.)

Correlation Matrix of All In-migration Rates with All Out-Migration Rates

	OUTRAT19	Rank19	OUTRAT20	Rank20	OUTRAT21	Rank21	OUTRAT22	Rank22	OUTRAT23	Rank23	OUTRAT24	Rank24
INRAT01	0.2346	26	0.0312	6	-0.1246	3	-0.0488	3	-0.0403	4	-0.0202	7
INRAT02	0.1532	23	0.0653	9	0.1493	11	0.1187	11	0.0248	9	0.0710	13
INRAT03	-0.0438	10	0.0667	10	0.3128	24	0.3307	24	0.2193	25	0.3695	25
INRAT04	-0.1356	5	0.0248	5	0.1086	7	0.2461	7	0.2502	17	0.5088	30
INRAT05	-0.1888	2	0.0202	4	0.2120	12	0.3288	12	0.3255	24	0.4851	29
INRAT06	-0.1361	4	0.0039	2	0.1460	10	0.2502	10	0.2466	18	0.3799	26
INRAT07	0.2596	27	0.0052	3	-0.2205	1	-0.2067	1	-0.1134	2	-0.1576	3
INRAT08	0.2801	28	0.1660	22	0.0339	5	0.0349	5	-0.0632	6	-0.1474	4
INRAT09	0.0802	21	0.2496	30	0.3750	26	0.2447	26	0.1204	16	0.0453	10
INRAT10	-0.1028	7	0.1987	25	0.4203	30	0.4025	30	0.3378	29	0.2564	22
INRAT11	-0.1932	1	0.1354	19	0.4036	28	0.3910	28	0.3360	28	0.3296	24
INRAT12	-0.1665	3	0.1569	21	0.3040	23	0.4405	23	0.4144	30	0.4550	28
INRAT13	0.3829	30	-0.0329	1	-0.1633	2	-0.2206	2	-0.1664	1	-0.1887	1
INRAT14	0.2242	25	0.0784	12	0.1969	6	0.0404	6	-0.0211	7	-0.0792	5
INRAT15	0.0734	20	0.2076	26	0.3040	22	0.2176	22	0.1329	14	0.0625	12
INRAT16	-0.0334	13	0.1268	18	0.2911	20	0.2878	20	0.2688	21	0.2103	20
INRAT17	-0.0958	8	0.1129	13	0.2521	17	0.3272	17	0.3495	23	0.2368	21
INRAT18	-0.1078	6	0.0545	8	0.2260	13	0.3666	13	0.3460	27	0.4046	27
INRAT19	0.3750	29	0.0695	11	-0.0784	4	-0.1672	4	-0.1971	3	-0.1582	2
INRAT20	0.1524	22	0.2341	28	0.3388	15	0.1167	15	0.0154	8	-0.0162	8
INRAT21	0.0506	19	0.2487	29	0.3908	27	0.2248	27	0.1401	15	0.0617	11
INRAT22	-0.0088	15	0.1805	24	0.3436	25	0.3349	25	0.2194	26	0.1282	14
INRAT23	-0.0384	11	0.1164	15	0.2451	16	0.3264	16	0.2471	22	0.1893	19
INRAT24	-0.0706	9	0.1178	16	0.2766	18	0.2823	18	0.2756	20	0.2443	23
INRAT25	0.1903	24	0.1479	20	0.1307	4	0.0292	8	-0.0210	5	-0.0236	6
INRAT26	0.0490	18	0.1729	23	0.2936	21	0.1838	21	0.1482	11	0.0170	9
INRAT27	-0.0048	17	0.2122	27	0.4095	29	0.2805	29	0.1662	19	0.1501	18
INRAT28	-0.0084	16	0.1264	17	0.2795	19	0.2048	19	0.1573	13	0.1363	16
INRAT29	-0.0353	12	0.1143	14	0.2271	14	0.1965	14	0.1193	12	0.1663	17
INRAT30	-0.0221	14	0.0471	7	0.1375	9	0.1502	9	0.1018	10	0.1318	15
Average	0.0371		0.1153		0.2011		0.1905		0.1447		0.1416	

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Table 2 (Cont.)

Correlation Matrix of All In-migration Rates with All Out-Migration Rates

	OUTRAT25	Rank25	OUTRAT26	Rank26	OUTRAT27	Rank27	OUTRAT28	Rank28	OUTRAT29	Rank29	OUTRAT30	Rank30
INRAT01	0.1759	21	-0.0227	2	-0.0406	3	-0.0511	1	-0.0141	2	-0.0625	3
INRAT02	0.2359	26	0.1046	10	0.0798	6	0.0330	5	0.0793	10	-0.0133	5
INRAT03	0.0592	16	0.1142	13	0.1734	16	0.1478	17	0.1196	18	0.1351	13
INRAT04	-0.0924	3	0.0151	4	0.0946	7	0.0674	8	0.0492	8	0.1996	26
INRAT05	-0.1172	1	0.0681	7	0.1670	14	0.0913	10	0.1471	24	0.2368	28
INRAT06	-0.1082	2	0.0226	5	0.1393	10	0.0930	11	0.0940	13	0.1846	23
INRAT07	0.1592	19	-0.0656	1	-0.1116	1	-0.0467	2	-0.0323	1	-0.1324	1
INRAT08	0.2857	29	0.0651	6	0.0266	5	0.0728	9	-0.0028	3	0.0051	7
INRAT09	0.2538	28	0.2434	26	0.2582	23	0.2662	30	0.0982	14	0.0984	10
INRAT10	0.0588	15	0.2682	28	0.3100	28	0.2062	25	0.1666	28	0.2297	27
INRAT11	-0.0559	5	0.1080	11	0.2716	26	0.2132	26	0.1283	20	0.1960	25
INRAT12	-0.0402	6	0.1316	15	0.2604	24	0.1873	23	0.1543	26	0.3080	30
INRAT13	0.2378	27	-0.0104	3	-0.0712	2	-0.0374	3	0.0009	4	-0.0928	2
INRAT14	0.2104	25	0.1210	14	0.0970	8	0.0671	7	0.1457	23	-0.0116	6
INRAT15	0.1671	20	0.2688	29	0.1695	15	0.2157	27	0.1473	25	0.1086	12
INRAT16	0.0194	11	0.2077	23	0.1842	18	0.1845	22	0.1857	30	0.1682	21
INRAT17	0.0060	9	0.2066	22	0.1544	12	0.1434	15	0.1557	27	0.1678	20
INRAT18	-0.0672	4	0.1094	9	0.1551	13	0.1571	20	0.0908	12	0.2454	29
INRAT19	0.3288	30	0.0899	9	-0.0042	4	0.0042	4	0.0031	5	-0.0400	4
INRAT20	0.1974	23	0.2542	27	0.1761	17	0.1430	14	0.1052	15	0.0944	9
INRAT21	0.1929	22	0.3360	30	0.3445	29	0.2515	28	0.1734	29	0.1459	16
INRAT22	0.0403	13	0.1969	20	0.2713	25	0.2029	24	0.1297	21	0.1357	14
INRAT23	0.0134	10	0.2083	24	0.2209	20	0.1442	16	0.1446	22	0.1373	15
INRAT24	-0.0314	7	0.1319	16	0.2741	27	0.1652	21	0.1153	17	0.1953	24
INRAT25	0.2049	24	0.1137	12	0.1189	9	0.0491	6	0.0247	7	0.0403	8
INRAT26	0.1104	18	0.2104	25	0.2118	19	0.1133	12	0.0196	6	0.1050	11
INRAT27	0.0976	17	0.1971	21	0.3635	30	0.2569	29	0.1216	19	0.1481	17
INRAT28	-0.0155	8	0.1629	18	0.2482	22	0.1547	18	0.0668	9	0.1533	18
INRAT29	0.0454	14	0.1772	19	0.2227	21	0.1560	19	0.1060	16	0.1542	19
INRAT30	0.0248	12	0.1342	17	0.1483	11	0.1205	13	0.0880	11	0.1695	22
Average	0.0866		0.1386		0.1638		0.1257		0.0937		0.1137	

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Table 2 (Cont.)
Correlation Matrix of All In-migration Rates with All Out-Migration Rates

	Average
INRAT01	-0.0120
INRAT02	0.0956
INRAT03	0.2035
INRAT04	0.1669
INRAT05	0.1746
INRAT06	0.1459
INRAT07	-0.0660
INRAT08	0.0187
INRAT09	0.1352
INRAT10	0.1804
INRAT11	0.1555
INRAT12	0.1959
INRAT13	-0.0462
INRAT14	0.0422
INRAT15	0.1302
INRAT16	0.1416
INRAT17	0.1357
INRAT18	0.1772
INRAT19	-0.0100
INRAT20	0.0909
INRAT21	0.1416
INRAT22	0.1370
INRAT23	0.1272
INRAT24	0.1392
INRAT25	0.0554
INRAT26	0.1032
INRAT27	0.1463
INRAT28	0.1117
INRAT29	0.1102
INRAT30	0.0780
Overall Average	0.1069

Table 3
Average Coorelations by differences
in Education and Age Categories
for In-migration and Out-Migration rates

Age			Educational Differences										
			In-migrants less than out-migrants					Same		In-migrants more than out-migrants			
Diff.	N	Total	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
Total	900	.109737	-.126928	-.087048	-.011968	.103381	.204812	.261897	.200502	.112198	.021076	-.062878	-.110276
-4.0	36	.072372	-.062500	-.013700	.054433	.077900	.098180	.142167	.126000	.083575	.038333	-.047300	-.108200
-3.0	72	.131792	-.076300	.000875	.065733	.126412	.183630	.224100	.211050	.178013	.076300	-.027300	-.088150
-2.0	108	.140637	-.125700	-.059067	.052167	.131725	.227593	.282750	.237847	.159492	.056322	-.039967	-.127333
-1.0	144	.138864	-.143525	-.099838	.010992	.149006	.253770	.327388	.236390	.132388	.027650	-.087438	-.139150
.0	180	.115133	-.134340	-.110460	-.039067	.107660	.221408	.301097	.218704	.108325	.001427	-.077600	-.102920
1.0	144	.091145	-.167925	-.132313	-.071275	.045550	.182545	.273750	.213445	.102675	-.002508	-.074263	-.131700
2.0	108	.082012	-.129600	-.107350	-.054700	.072275	.180433	.229733	.169487	.074017	.004300	-.067500	-.130233
3.0	72	.083603	-.092150	-.077050	-.025500	.104788	.202050	.186925	.129900	.057200	.007850	-.034125	-.052100
4.0	36	.076617	-.090400	-.030000	.010367	.115700	.174380	.135717	.089780	.068550	.030700	-.044600	.002500

Age Differences:
Negative: In-migrants younger than out-migrants
0: Same age
Positive: In-migrants older than out-migrants

Table 4
Anova, effect of education/age differences

All Counties:

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	13.911	18	.773	40.407	.000
POS1	13.374(44%)	10	1.337	69.924	.000
POS2	.537(2%)	8	.067	3.511	.001
2-way Interactions	.867	80	.011	.567	.999
POS1 POS2	.867	80	.011	.567	.999
Explained	14.779	98	.151	7.884	.000
Residual	15.320	801	.019		
Total	30.099	899	.033		

Counties without colleges or Universities:

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	5.055	18	.281	25.489	.000
POS1	4.639(32%)	10	.464	42.103	.000
POS2	.416(3%)	8	.052	4.722	.000
2-way Interactions	.449	80	.006	.510	1.000
POS1 POS2	.449	80	.006	.510	1.000
Explained	5.504	98	.056	5.098	.000
Residual	8.825	801	.011		
Total	14.329	899	.016		

Counties with colleges or universities:

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	20.009	18	1.112	38.682	.000
POS1	19.655(44%)	10	1.965	68.394	.000
POS2	.355(1%)	8	.044	1.542	.139
2-way Interactions	1.523	80	.019	.663	.989
POS1 POS2	1.523	80	.019	.663	.989
Explained	21.533	98	.220	7.646	.000
Residual	23.019	801	.029		
Total	44.552	899	.050		

POS1: This represents In-migrant/Out-migrant differences in educational level.
POS2: This represents In-migrant/Out-migrant differences in age.

Table 5

COUNTY	STATE	OUTFACT4	INFACT5	DELTA	POP70	POP80
GALLATIN	Kentucky	2.41531	2.16197	.00	4134.00	4842.00
JACKSON	Kentucky	1.50388	1.93527	.00	10005.00	11996.00
LEWIS	Kentucky	1.80401	1.54720	.00	12355.00	14545.00
MENIFEE	Kentucky	3.91784	3.94831	.00	4050.00	5117.00
OWEN	Kentucky	1.50735	2.27062	.00	7470.00	8924.00
POWELL	Kentucky	1.60690	2.57295	.00	7704.00	11101.00
ROBERTSON	Kentucky	3.92092	2.00459	.00	2223.00	2265.00
WHITLEY	Kentucky	1.81764	1.51035	.00	24145.00	33396.00
WOLFE	Kentucky	2.83543	3.48101	.00	5669.00	6698.00
SUNFLOWER	Mississippi	2.77916	3.00676	1.00	37047.00	34844.00
LAKE	Tennessee	2.31749	1.51565	2.00	7896.00	7455.00
POLK	Tennessee	2.11103	4.30441	.00	11669.00	13602.00

OUTFACT4: This factor is made up almost entirely of the out-migration rates of those with the lowest levels of education (elementary school or less) for all ages up to 64.

INFACT5: This factor is made up almost entirely of the in-migration rates for those with the lowest levels of education (elementary school or less) for ages 18 through 44.

DELTA: .00 Non-delta rural counties 1.00 Core delta counties
2.00 Fringe delta counties

Table 6

Correlation matrix of the 900 in/out migration correlations for all counties, each of the delta states, and the counties with and without colleges

Correlations:	TOTAL	NOCOL	COLLEGE	ARKANSAS	ILLINOIS	KENTUCKY	LOUSIANA	MISSISSI	MISSOURI	TENNESS
TOTAL	1.0000	.7927**	.9468**	.6768**	.8130**	.8429**	.7610**	.8104**	.8713**	.9968**
NOCOL	.7927**	1.0000	.6570**	.5251**	.4582**	.6663**	.6542**	.5296**	.6587**	.7965**
COLLEGE	.9468**	.6570**	1.0000	.5933**	.8197**	.8130**	.7181**	.7810**	.8123**	.9403**
ARKANSAS	.6768**	.5251**	.5933**	1.0000	.5704**	.4350**	.4365**	.5403**	.6053**	.6924**
ILLINOIS	.8130**	.4582**	.8197**	.5704**	1.0000	.6416**	.5890**	.6970**	.7312**	.8107**
KENTUCKY	.8429**	.6663**	.8130**	.4350**	.6416**	1.0000	.6772**	.7112**	.6466**	.8328**
LOUSIANA	.7610**	.6542**	.7181**	.4365**	.5890**	.6772**	1.0000	.5855**	.5904**	.7554**
MISSISSI	.8104**	.5296**	.7810**	.5403**	.6970**	.7112**	.5855**	1.0000	.6712**	.8113**
MISSOURI	.8713**	.6587**	.8123**	.6053**	.7312**	.6466**	.5904**	.6712**	1.0000	.8819**
TENNESSE	.9968**	.7965**	.9403**	.6924**	.8107**	.8328**	.7554**	.8113**	.8819**	1.0000

N of cases: 900 1-tailed Signif: * - .01 ** - .001

Figure 1: Average Correlations By Age and Education Differences

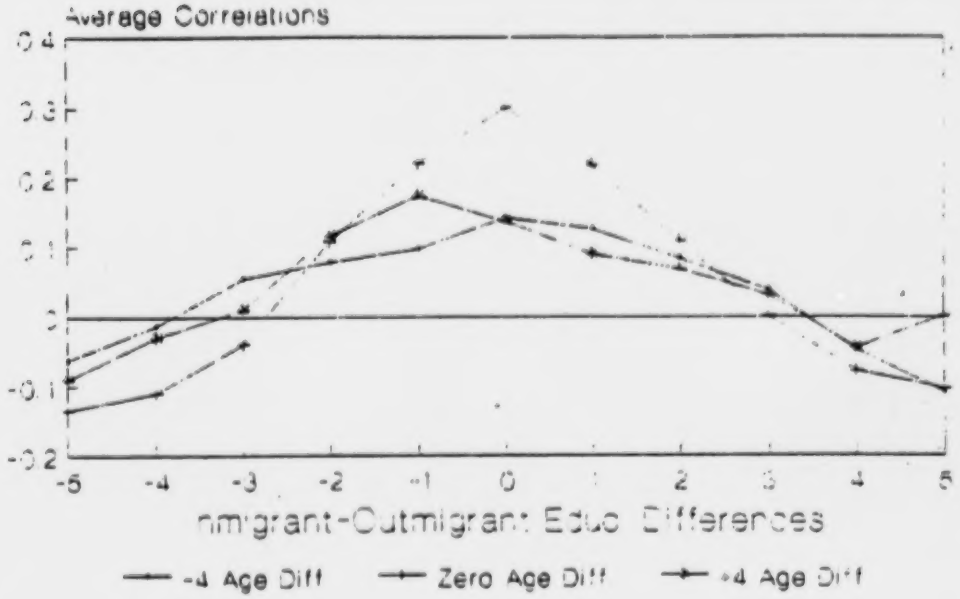

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Figure 2: Average Correlations by Educ. and Age diff.

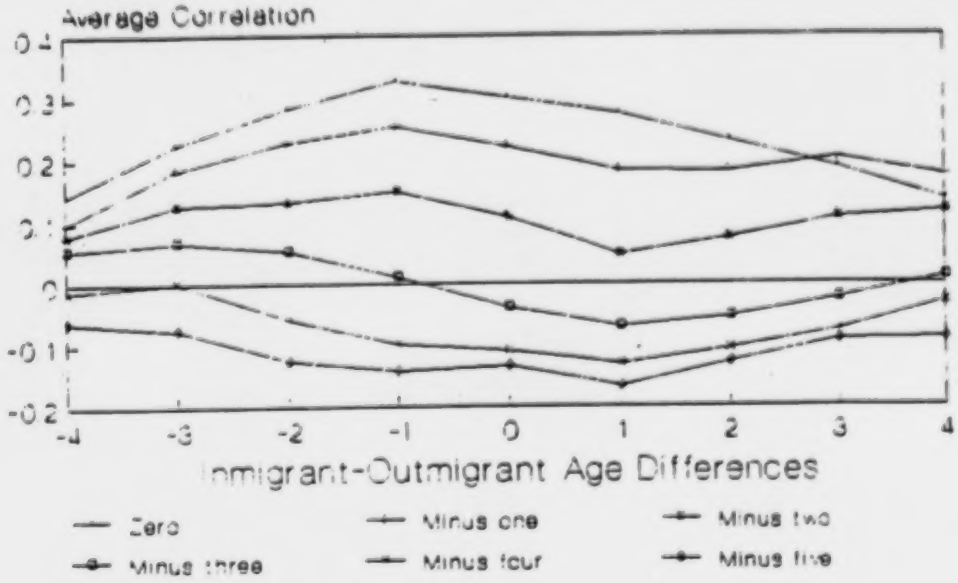

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Figure 3: Average Correlations by Educ. and Age diff.

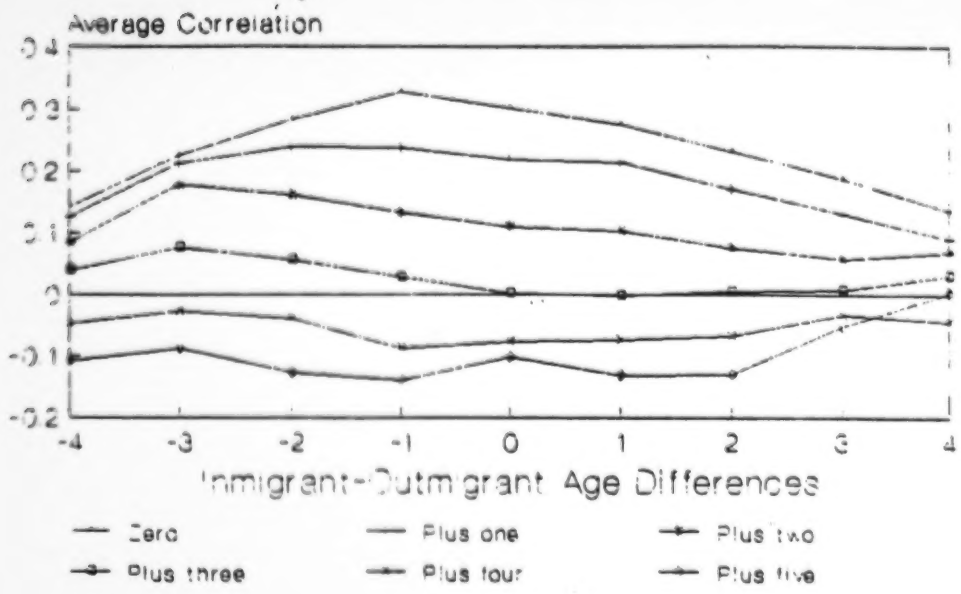

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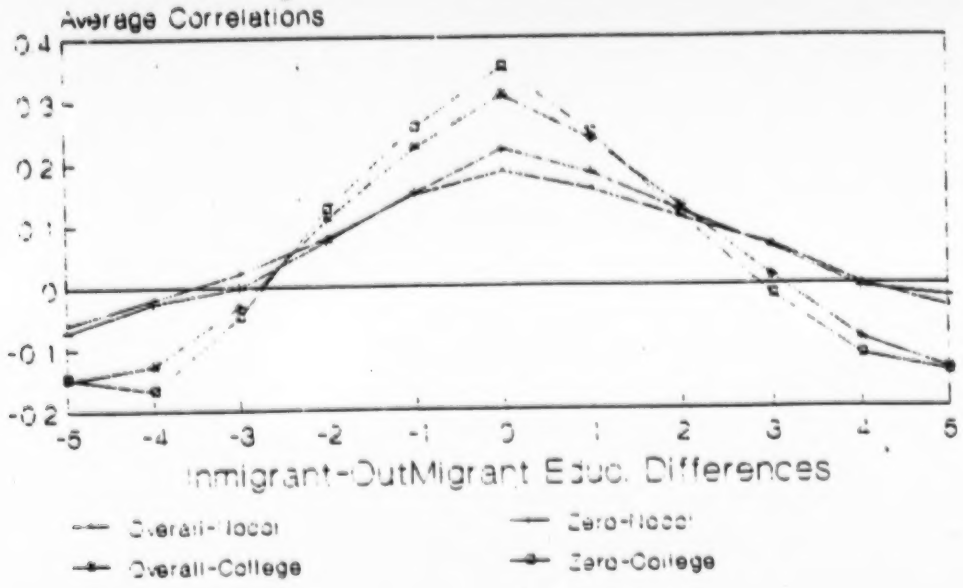
Figure 4: Average Correlations By Age and Education Differences



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